

ON A COLLECTION OF MYRIAPODS FROM  
COSTA RICA

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These notes are based upon a small but very interesting collection of chilopods and diplopods made by Dr. Philip P. Calvert in Costa Rica during 1909-1910. Fifteen species are represented, of which seven appear to be new. The collection will be placed in the Academy of Natural Sciences of Philadelphia, with some duplicates in the Museum of Comparative Zoology at Cambridge, Massachusetts.

The following species were taken from among the leaves of members of the Bromeliaceae:

*Chilopods*

*Otocryptops melanostomus* (Newport)

*Newportia longitarsis* (Newport)

*Scolopendra viridis* (Say)

*Diplopods*

*Aphelidesmus calverti* sp. nov.

*Aphelidesmus* sp.

The crowded expanded bases of the leaves of the bromeliads accumulate dust and humus and catch and retain a considerable amount of moisture, so that they would seem naturally to furnish favorable retreats for myriapods. A larger list of myriapods found inhabiting these plants is given by Picado,<sup>1</sup> and there seems no reason to doubt that the list may in time be extended to include a large proportion of the myriapod fauna of the region. I am under obligation to Dr. Calvert for the privilege of studying this material.

CLASS CHILOPODA

SCOLOPENDROIDEA

CRYPTOPIDAE

**Cryptops** sp.

A single specimen from Juan Viñas (June 23 to 29, 1910). The anal legs are missing, making accurate determination of the species difficult.

<sup>1</sup> G. Picado: Les Bromeliacées Epiphytes Milieu Biologique, Bull. Scientif. de France et Belgique, October, 1913.

**Newportia longitarsis** (Newport)

One specimen taken from a bromeliad in the Reventazon Valley below Juan Viñas (October 3, 1909).

This is a widely distributed species occurring also in the West Indies and in South America.

**Otocryptops melanostomus** (Newport)

One specimen taken in an arboricolous bromeliad on the Rio Reventazon (March 6, 1910).

A species widespread in the East Indies as well as throughout the West Indies, Central America and South America from Argentina northward.

**SCOLOPENDRIDAE****Scolopendra viridis** (Say)

A single specimen taken from a bromeliad below railroad track, Juan Viñas (April 26, 1910).

A species distributed from Central America northward through Mexico to the southern United States.

**CLASS DIPLOPODA****COLOBOGNATHA****SIPHONOPHORIDAE****Siphonophora costaricæ sp. nov.**

Uniform light or yellowish brown.

Head subpiriform. Rostrum moderately long, a little shorter than the head.

Antennae long, much exceeding the rostrum; distally strongly crassate, clavate, the proximal articles being much narrower.

First tergite with anterior border deeply emarginate.

Number of segments 94 (♀).

Length near 36 mm.

*Locality*.—Juan Viñas (June 23 to 29, 1910). This species seems to be close to *S. cornuta* Pocock, described from Guatemala. It may readily be separated, however, by the conspicuously crassate antennae, these in *cornuta* being of nearly uniform diameter from the base to the distal end. The antennae are decidedly longer than in *brevicornis* which also has fewer segments to the body and is smaller.

*SPIROBOLOIDEA**SPIROBOLIDAE**Rhinocricus plesius* sp. nov.

Color deep shining black; first tergite narrowly margined anteriorly and posteriorly with brown and the anal tergite similarly margined posteriorly and the anal valves mesally. Antennae and legs light brown.

Body a very little narrowed caudad from middle and also narrowed slightly cephalad. Metazonites weakly protruding. Scobina detectable back as far as the thirty-sixth segment.

Head smooth and shining. Sulcus across vertex deep; ending considerably above level of antennal sockets. A fine median longitudinal sulcus reappearing between antennae and extending to labrum, becoming more distinct ventrad. A deep foveola each side of median line a little dorsad of margin of labrum and a second, smaller and shallower one farther laterad at very edge of labrum.

Antennae short as usual, all the articles with the exception of the second as wide as or wider than long. Terminal sensory cones numerous (Group Polyrhabdi of Brölemann).

Eyes subtriangular. Ocelli 24 to 27 in 6 series: 5, 6, 5, 4, 3, 1 and 6, 6, 6, 4, 3, 2.

First dorsal plate with anterior margin nearly straight, being but very slightly convex between points near level of lower corners of eyes; below level of eyes the margin is incurved or emarginate and slants obliquely ventrocaudad to the well rounded lateral end. A sharply impressed transverse sulcus on each side at about one-fourth the length from caudal margin, this sulcus curving cephalad at ectal end. A second, somewhat obscure and irregular depression parallel with and cephalad from the first. Several short striae extending caudad from anterior margin on each side at or near level of eye. Marked across median region with a considerable number of obscure, irregular, short and fine lines.

Second tergite extending considerably below ends of the first; its ventral margin slightly indented at middle of its length, behind which the plate is thickened or somewhat nodular.

Anterior division of prozonites separated from the posterior by a fine but very distinct circumferential stria, which is a little wavy and which terminates on the ventral side at an angle in a transverse stria extending entirely across the prozonite; a transverse stria at level of pore across anterior division; anterior division marked densely with fine, irregular concentric striae which are fewer toward the caudal division; from the dividing stria above there extend a series of short coarser longitudinal impressed lines. Caudal division of prozonite very densely roughened or coriarious, the impressions small but deep and the elevations between them narrow and forming a close, irregular reticulation. Metazonite short, smooth and shining; a series of obscure, short longitudinal impressed lines along suture above. Suleus straight and distinct; not bent at pore or on some of caudal segments a little angulate. Pore contiguous with or very close to suture.

Anal tergite with sides meeting posteriorly at angle of about  $90^{\circ}$  or a little greater, the angle narrowly rounded. Not covering the upper angles of anal valves which extend clearly farther caudad. Anterior portion of surface under lens seen to be weakly and finely coriarious the caudal portion more strongly so but much weaker than on posterior division of prozonite of trunk segments.

Anal valves with mesal edges compressed and conspicuously protruding but with no margining sulcus. Smooth and shining or under lens showing obscure coriarious markings.

Anal scale caudad extended in linguiform process which is distally subacute. Process smooth and shining, the other parts finely roughened.

The gonopods are very similar to those of *R. costaricensis* Brölemann. The accessory branch is very broad, laminate, and is distally more acute than in *costaricensis*. The stile is straight and slender, longer and distally more acute than in the other species. The gonopod curves evenly, being not at all geniculate.

Number of segments 44 ( $\sigma$ ).

Length about 93 mm.

*Locality*.—Rio Oro Valley near Cachi (March 8, 1910). One male.

Closely related to *R. costaricensis* Brölemann, but differing, among other points, in having the posterior division of the prozonites strongly roughened instead of smooth; in differently shaped anal tergite which does not cover angles of valves; in having scobina on a much larger number of segments; and to some extent in the gonopods.

#### POLYDESMOIDEA

##### PERIDONTODESMIDAE

###### *Peridotodesmus electus* sp. nov.

Dorsum uniform testaceous to light brown, individuals in full color showing typically along dorsum a median longitudinal black line. Venter and legs lighter, yellow to testaceous.

Body narrowing slightly cephalad and more decidedly caudad.

Vertex of head crossed by a short sharp sulcus which is deepest at inferior end. Head clothed with numerous fine short hairs over vertex as well as over frontal and more ventral region. Antennae similarly clothed over entire length but more sparsely proximally.

First dorsal plate about equal in width to head inclusive of mandibles. Anterior margin widely convex, taken with anterior half of each lateral margin semicircular, the median tooth of lateral margin at point farthest laterad. Anterior margin bearing about 16 setiferous tubercles which increase in size laterad and pass gradually into the teeth of the lateral margin which are 4 in number. In addition there are numerous similar tubercles

over the entire surface, these rather irregularly arranged but referable to 5 (or 6) transverse rows.

Second tergite with keels horizontal and of good size, longer than median portion of metazonite, bent a little cephalad. Anterior margin of keel nearly straight, the anterior angle subrectangular and the caudal one similar but a little rounded; lateral teeth 5, or 1 of these subcaudal in position, the teeth on caudal side of keel 3, 3 transverse rows of tubercles.

The immediately succeeding tergites similar to the second, but the keels shorter and not bent forwards; the caudolateral angles also becoming more and more rounded or obliterated as such so that the lateral and caudal margins together form an even and continuous curve; the anterior angle subacute. The 3 teeth referable to lateral edge smaller than those properly belonging to the caudal edge. The more caudal plates with anterior margin of keels becoming more and more convex and slanting more caudad, the anterior angle becoming rounded while the caudal angle reappears and becomes more and more acute, in the last 2 or 3 plates rather conspicuously produced caudad.

Anal scutum with process bluntly rounded; bearing the usual 2 setigerous tubercles. Dorsal surface with numerous setigerous tubercles.

Anal valves distinctly margined mesally. Lateral margins substraight. A large setigerous tubercle just ectad of middle of mesal margin on each valve.

Gonopods of male in general similar to those of *flagellatus* but the longer ventral rod at proximal end bent ectad instead of mesad and distally not evenly curving, but ending in an abruptly more slender falciform division as shown in the figure. Stile extending distad and not bending proximad in the more usual way.

Length ♀ ♀ near 9 mm.; width, 1.5 mm. Of ♂♂ near 7 mm.; width 1+ mm.

*Locality*.—Juan Viñas: Laguna (elevation 3300 ft. October 1, 1909). Numerous specimens taken under a log, some noted as pairing.

In color and size very similar to *P. flagellatus* but more slender; gonopods especially differing conspicuously as above noted.

#### PLATYRACHIDAE

##### **Platyrachus montivagus** Carl

One male from the Reventazon Valley, near Cachi (March 6, 1910).

Described from Costa Rica originally, and previously recorded from several localities in that country.

##### **Platyrachus antius** sp. nov.

Dorsum black, with keels yellow, the black extending more or less along caudal margin of keels, the dark band in part may be of deep chocolate

brown tinge; the yellow lateral band across the keels of each side distinctly narrower than the median black band; on some of the tergites (in female from Reventazon Road) a rather obscurely outlined paler spot may be present in border of black band on each side. Head black excepting labial border which is yellowish. Antennae and legs uniform brown.

Head roughened, finely coriarious and shagreened, excepting labial area which remains smooth; bordering upper edge of labrum a conspicuous transverse setiferous ridge. Vertex with a conspicuous larger tubercle on each side. Median sulcus distinct, passing into a broad depression between antennae. Rim of antennal sockets on dorsal side elevated and thickened. A median longitudinal ridge-like elevation beginning between antennae and passing ventrad to bifurcate at clypeal region like an inverted Y, the branches coarser and more tubercular in character; area between branches smoother than other parts excepting the labrum (this ridge more indistinct in female from Reventazon Road).

Antennae reaching a little caudad of posterior border of first dorsal plate. Sixth segment long and, as commonly so, of smaller diameter than the preceding segments.

First dorsal plate wider than the head. Anterior margin lightly convex; margin laterally slanting back ectocaudad to the posterior angle which is less than rectangular, this lateral part of margin distinctly sinuate, there being four crenations. Caudal margin between angles bow-shaped but with median portion straight. A row of small tubercles along anterior and posterior borders. Entire surface granular or shagreened.

Keels of second tergite bent forwards. Both anterior and posterior angles rounded but the latter less so. Lateral margin conspicuously crenate, the elevations regular.

In succeeding tergites the keels become more and more nearly transverse; the posterior corner becomes more angular and then produced caudad at first weakly and then more strongly and acutely, in posterior segments becoming spinose; on nineteenth tergite the processes of keels are large but bluntly rounded while those of the eighteenth are subacute though broader and less sharp than in preceding segments. Lateral margin of keels in proceeding caudad becoming conspicuously irregular and often deeply notched, but in eighteenth and nineteenth wholly smooth. Anterior edge of keels from eleventh to eighteenth finely serrulate and the caudal margin serrulate from sixth or seventh to seventeenth. Pores large; on all but last two tergites removed by less than twice their diameter from nearest point on margin. Surface of all tergites densely finely tubercular or shagreened.

Anal tergite with caudal margins rounded, semi-eircular. Proximal portion finely shagreened, the distal portion under lens appearing more finely coriarious.

Anal valves with mesal margins elevated. Two setigerous tubercles just ectad of mesal marginal elevation on each side, one behind the other. Surface irregularly tubercular.

Anal scale with caudal margin between tubercles straight or weakly incurved.

Sternites not sulcate. Each one from fourth caudad with four distinct tubercles, one at base of each leg, these conspicuous and subconical on the anterior plates but becoming more and more inconspicuous caudad. In the male the two tubercles present at bases of seventh legs well developed. No conical process on fourth sternite such as described by Pocock for *P. tristani*.

Gonopods of male with proximal portion nearly straight, distally evenly curving, first in a cephalomeso-dorsal direction, then dorsad and then back a little caudad of ectad. Distal end broad, laminate. The stile short and rather slender, bending across the laminate division as shown in the figure.

Length 76 ( $\sigma$ ) to 78 mm.; width of  $\sigma$  type cir. 14 mm.

*Localities*.—Juan Viñas: “Nearer Waterfall” (one male, type, April 26, 1910); Reventazon Road (one female, February 15, 1910).

Seemingly closely allied with *P. tristani* Pocock from which I separate it chiefly because of the following differences: the greater relative width of the dorsal black band; especially the more irregular lateral margins of the keels which are in some segments conspicuously incised, with the pores larger and uniformly closer to the margin and never removed by as much as twice their diameter excepting in the most caudal segments; the lack of a conical process on the fourth sternite in the male. There are various other minor differences. The gonopods in the two species are very similar.

#### *Aphelidesmus calverti* sp. nov.

Anterior portion of metazonites above chocolate brown, posterior border and entire keels yellow. Antennae light brown with seventh joint brown.

Head smooth. Suleus across vertex deep, ending at level of antennae. Between bases of antennae a pair of bristles on light spots, a similar but much more widely separated pair midway between these and the labial margin.

Antennae inserted close together, moderately short, articles in order of length 6, 5, 4; 3 and 2 subequal and but little differing from the fourth.

First tergite much wider than head. The anterior and lateral margins together forming a continuous even curve which is subsemicircular, a slight indentation marking point of juncture. Carinae narrowly rounded.

Anterior corners of all carinae well rounded. Second, third and fourth with an obscure blunt tooth on ectal side near anterior corner which is not evident on more caudal keels, the edges of which are smooth. Edges of keels in pore-bearing plates thickened, the pore on edge near base of caudal process. Posterior angles of all carinae distinctly produced caudad, spiniform. Surface of all tergites smooth, with no sulci or sculpturing.

Anal tergite of moderate width; sides weakly convex, converging caudad; caudal margin convex, not at all emarginate (see figure).

Anal valves strongly margined as usual.

Anal scale with caudal margin convex, weakly convexly protruding between the setae and mesally slightly indented.

Gonopods of male with stile arising on ectal side of distal division and curving ventrad of it proximal of its middle, then running distad behind (dorsad of) a thin plate-like division as shown in the figures.

Genital processes on second legs of male very small, subconical.

Length of type ( $\sigma$ ) near 27 mm.; width 3.25 mm.

*Locality*.—La Emilia (November 16, 1909). Named in honor of Dr. Calvert.

***Aphelidesmus intermedius* sp. nov.**

Deep chocolate brown, the outer portion of carinae and the caudal portion of anal tergite light yellow. Antennae and legs pale brown.

Head smooth. Sulcus across vertex deep; terminating abruptly at level of edge of antennal sockets. A long bristle springing from a light spot just below base of each antenna and a transverse row of similar bristles across clypeal region.

Antennae inserted very close together, short. Sixth article much the longest, the second and fifth, and the third and fourth, not much differing in length, the first two slightly longer than the latter.

First dorsal plate much wider than head. Surface finely and densely granular. Anterior margin convex. Keels rather strongly bent down, with anterior margin sloping back caudoectad; the caudal margin nearly transverse, and the outer end of keel well rounded.

Second dorsal plate with anterior corner of keel rounded, a small blunt tooth on its outer side. Caudal corner subrectangular, but the caudal margin extending a little caudad of ectad. Third and fourth plates nearly like the second but marginal tooth farther caudad. Succeeding plates lacking the small tooth, the anterior corner more strongly rounded, the side from it rounding back obliquely a little ectad of caudad to the caudal corner which becomes rather strongly and acutely produced and spiniform. Processes of nineteenth segment short. Surface of tergites from second caudad showing polygonal areas marked off by paler lines but area not elevated nor lines sulciform; one row of areas on prozonite and two on metazonite. Margin of keel on pore-bearing segments strongly thickened with the pore always strictly lateral in position.

Anal tergite with sides strongly converging caudad, as in type species of genus, with the caudal margin widely rounded though median portion not very convex.

Anal scale with caudal margin between setae wide and only very weakly convex, nearly straight.

Length ( $\varphi$ ) about 31 mm.; width near 3.5 mm.

*Locality*.—Juan Viñas (June 23 to 29, 1910). The type is a female.

**Aphelidesmus** sp.

*Locality*.—La Emilia.

A single immature female specimen from a bromeliad along with *Aphelidesmus calverti*, which species it resembles in coloration but with polygonal areas outlined on prozonite and metazonite as in *A. intermedius*, the limiting paler lines not at all impressed. Antennae less clavate than in *A. calverti*.

**Aphelidesmus** sp.

*Locality*.—Juan Viñas: Reventazon Road (February 15, 1910). A very young female of uncertain species.

**CHELODESMIDAE****Aceratophyllus dux** sp. nov.

Dorsum between keels brown; a deeper brown circular spot just proximad of each keel; the keels and caudal border of metazonites more yellowish brown and in part of dilute orange caste; an interrupted longitudinal median dorsal dark line over caudal half of body. Distal half of sixth article of antennae rufous. Legs light brown.

Vertex of head glabrous; crossed by a sharply impressed sulcus which extends to level of antennae. On each side of sulcus in upper frontal region a pair of setigerous foveolae; bristles present below this level, these increasing in length and number ventrad, the lower ones long.

Antennae long; fifth and sixth articles distinctly the longest.

First dorsal plate much wider than the head. Anterior margin mesally straight, at ends curving back about the rounded anterior corners. Caudal corners subrectangular.

Second dorsal plate with anterior corners also rounded; a single small tooth on ectal side of corner; caudal corners rectangular or slightly produced caudad. The immediately succeeding plates similar but anterior corner more angular, the single tooth at or near corner present in all. The pore-bearing plates with edge conspicuously thickened about pore, the thickening regularly decreasing from pore toward each corner. In proceeding caudad the plates increase in size and their caudal corners become more and more produced, the processes in the most caudal ones moderately long and acute. In all tergites the keels are bent up dorsad so that their lateral edges are above level of median portion of tergites.

Anal tergite with distal portion bluntly rounded or with the median apical portion truncate; bearing 2 shorter and 2 very long bristles at tip, a pair farther proximad and a pair of short ones on ventral side. Proximal subtriangular portion with a pair of long bristles near each lateral margin.

Anal valves with mesal border strongly margined. Two bristles just ectad of elevated margin on each valve.

Anal scale with caudal margin evenly convex; bearing a long bristle a short distance each side of median line.

Gonopods of male of usual type. Outer branch of distal division distally truncate, not acute as in *unicolor* Carl. Inner branch (stile) not geniculate, not distally expanded in button-like form as in *unicolor* nor deeply and unevenly notched as in *lamellifer* Brölemann (see figure).

Seminal processes of second legs in male long and slender, distally acute. Length of type ( $\sigma$ ) near 31 mm.; width 5 mm.

*Locality*.—Juan Viñas (June 23 to 29, 1910). One male.

Readily separated from other species by character of male gonopods.

#### EXPLANATION OF PLATE II

Fig. 1.—*Siphonophora costaricae* sp. nov. Head and first two tergites, dorsal view.

- " 2.—*Rhinocricus plesius* sp. nov. Distal portion of male gonopod.
- " 3.—*Peridotodesmus electus* sp. nov. Left gonopod of male, ventral view.
- " 4.—*Platyrachus antius* sp. nov. Right keel of tenth segment, dorsal view.
- " 5.—The same. Left gonopod of male, ectal view.
- " 6.—*Aphelidesmus calverti* sp. nov. Right gonopod of male, ventral view.
- " 7.—The same. Left gonopod of male, lateral view.
- " 8.—*Aphelidesmus intermedius* sp. nov. Right keel of fifteenth segment, dorsal view.
- " 9.—The same. Last tergite.
- " 10.—" " Anal scale.
- " 11.—*Aceratophyllus dux* sp. nov. Left gonopod, ventral view.